Offre n°2023-07002

Post-Doctoral Research Visit F/M Handling missing values in multiblock data

Le descriptif de l’offre ci-dessous est en Anglais

Type de contrat : CDD

Niveau de diplôme exigé : Thèse ou équivalent

Fonction : Post-Doctorant

A propos du centre ou de la direction fonctionnelle

The Inria centre at Université Côte d’Azur includes 37 research teams and 8 support services. The centre’s staff (about 500 people) is made up of scientists of different nationalities, engineers, technicians and administrative staff. The teams are mainly located on the university campuses of Sophia Antipolis and Nice as well as Montpellier, in close collaboration with research and higher education laboratories and establishments (Université Côte d’Azur, CNRS, INRAE, INSERM ...), but also with the regiona economic players.

With a presence in the fields of computational neuroscience and biology, data science and modeling, software engineering and certification, as well as collaborative robotics, the Inria Centre at Université Côte d’Azur is a major player in terms of scientific excellence through its results and collaborations at both European and international levels.

Contexte et atouts du poste

Within the framework of the PEPR, DIGPHAT Digital Pharmacological Twins

where the aim is to model multi-scale and longitudinal data in pharmacology, the candidate will develop methods to handle missing values

Mission confiée

Assignments :

With the help of Julie Josse, the recruited person will conduct research on missing values.

For a better knowledge of the proposed research subject :

A state of the art, bibliography and scientific references are available at the following URL, do not hesitate to log in:

Website with resources on missing values https://rmisstastic.netlify.app/

Team website https://team.inria.fr/premedical/

Collaboration :

The recruited person will be in connection with Jean-Baptiste Woillard who is a key interlocutor for the PEPR DIGPATH

Principales activités
The project will use data sets of different types, sources and cohorts, standardization procedures will be carried out to ensure the quality of the data and the removal of experimental technical biases. In addition, missing values are systematically encountered in clinical, biological and pharmacological data collections and can lead to significant loss of data that cannot be taken into account by computational models. Statistical and machine learning approaches for the imputation of missing values will be implemented to take this issue into account and generate optimal databases for the development of pharmacological models.

Naive approaches such as complete-case analysis which can lead to important bias, cannot be applied in high-dimensional settings when almost all data can be deleted. There exists an abundant literature on the topic and many methods are available either to estimate some parameters (EM, multiple imputation) or to do supervised learning with missing values. However, missing data structured by block of variables represent a new field of the statistical analysis of missing data, which has not been studied until now. We will consider two approaches: 1) imputing the data so that it can be analysed by any analyst with any statistical methods and 2) modifying the statistical algorithm so that it can handle missing values. For the former we will consider imputation of missing values with low-rank methods for multi-block data to take into account the relationships between variables of different groups and the relationships between observations while reducing the dimensionality of the problems. Such methods can also be considered in a multiple imputation setting to reflect the variability due to missing values and assess which confidence should be given to an analysis performed from an incomplete data set. Handling missing values with multi-source data (either structured by block of variables of different nature or by blocks of observations) will be an innovation. From a methodological point of view, the goals are to develop a framework to handle missing values in data integration and to account for the variability due to missing values. Many projects require complex, heterogeneous, and large databases to be analyzed by multiple teams for which data repositories are created. Such data are highly incomplete so that the imputation methods developed in this project could become standard in this context and would avoid important biases due to bad management of missing data.

**Compétences**

Technical skills and level required:

Languages:

Relational skills:

Other valued appreciated:

**Avantages**

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

**Rémunération**

Gross Salary: 2788 € per month

**Informations générales**

- Thème/Domaine: Neurosciences et médecine numériques Statistiques (Big data) (BAP E)
- Ville: Montpellier
- Centre Inria: Centre Inria d'Université Côte d'Azur
- Date de prise de fonction souhaitée: 2024-02-01
- Durée de contrat: 1 an
- Date limite pour postuler: 2024-02-29

**Contacts**

- Équipe Inria: PREMEDICAL
- Recruteur: Josse Julie / julie.josse@inria.fr
A propos d'Inria

Inria est l'institut national de recherche dédié aux sciences et technologies du numérique. Il emploie 2600 personnes. Ses 215 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3900 scientifiques pour relever les défis du numérique, souvent à l'interface d'autres disciplines. L'institut fait appel à de nombreux talents dans plus d'une quarantaine de métiers différents. 900 personnels d'appui à la recherche et à l'innovation contribuent à faire émerger et grandir des projets scientifiques ou entrepreneuriaux qui impactent le monde. Inria travaille avec de nombreuses entreprises et a accompagné la création de plus de 200 start-up. L'institut s'efforce ainsi de répondre aux enjeux de la transformation numérique de la science, de la société et de l'économie.

L'essentiel pour réussir

There you can provide a "broad outline" of the collaborator you are looking for what you consider to be necessary and sufficient, and which may combine:

- tastes and appetencies,
- area of excellence,
- personality or character traits,
- cross-disciplinary knowledge and expertise...

This section enables the more formal list of skills to be completed and 'lightened' (reduced):

- "Essential qualities in order to fulfil this assignment are feeling at ease in an environment of scientific dynamics and wanting to learn and listen."
- "Passionate about innovation, with expertise in Ruby on Rails development and strong influencing skills. A thesis in the field of **** is a real asset."

Attention: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.

Consignes pour postuler

Applications must be submitted online on the Inria website. Collecting applications by other channels is not guaranteed.

The position is open to:
- Inria internal mobility, remuneration according to statutory conditions
- mobility from other public body, by posting for a period of three years, renewable, remuneration according to statutory conditions
- in short term contract from service fixed-term

Sécurité défense :
Ce poste est susceptible d'être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L'autorisation d'accès à une zone est délivrée par le chef d'établissement, après avis ministériel favorable, tel que défini dans l'arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l'annulation du recrutement.

Politique de recrutement :
Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.